New York as a Port Has Much to Learn From Seattle

of 192 miles on the ocean and fresh water.

anderful Strides in Harbor Making and Freight Handling Made by Energetic Pacific Coast City Furnish a Striking Object Lesson to America's Greatest Entrepot

Commercial men in ports on the eastern coast may learn much from the story commercial harbor development that accompanies this and which tells of what the story of the sto as done and is doing Shipping men, especially, should be inter-of the writer contrasts sharply the inertia that marks America's greatest for the writer that fairly hums in one of the newest Pacific coast cities, and the activity that fairly hums in one of the newest Pacific coast cities, and the freight handling machinery is the particular point stressed by the writer by description of the efficient devices installed is one of the most important

e facilities have been a source of

There is no real reason way the far sighted Port Commission bough enterprise, and private enterprise has was not a minor shipping cen-

York's Great Opportunity Arouses But Little Enthusiasm

mins congested, langing on facilities

my its opportunity, and seized that at year the city of Seattle formed Mripal corporation known as the Port tion and set to work.

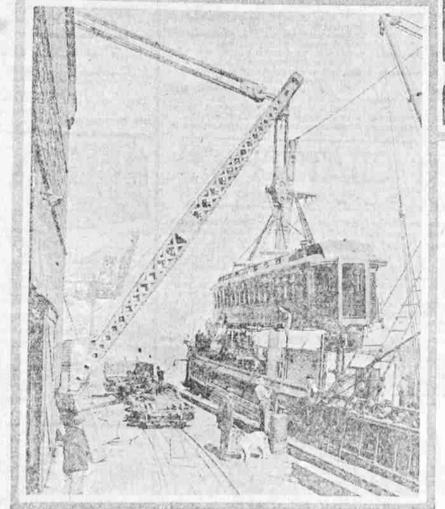
torrates \$16,000,000 worth of harbor trie profits and is reaching out for more sping heard is working with one of helle ship owning concerns for the tion of one of the abandoned war shippard sites into a new terminal th and passenger service. This is set \$5,000,000 more. Without this addimunicipality can bount of two units twenty ships at once the most amso thing of their kind in any port in world. We hear of Western "go."

shantages and, even more, freedom cendvantages unknown to the older New York, San Francisco, New Orand the Guif parts, Boston, Ralrimore Philadelphia have all needed in the and will need in the future, millions is dredging to keep the channels Stattle escapes this heavy item of Web a minimum depth of 156 feet taler in Puzet Sound, the largest vesservice make port and find berthage and even the aid of pilot or tow. They and it. Tempered by the Japan small, the climate is mild and the harbor steped with ice.

the and the Government

Join in Harbor Enterprise om the harbor are two large Is 1917 Seattle and the Government. int enterprise, cut a canal, built locks amodate vessels up to a length of fet and by joining these lakes to Puget trested a sheltered inner harbor hips may unload without inconvenfrom the rise and fall of tides. Their may there be freed of marine as Or the ships may be stored when the There is nothing else like it tounity. Later still the Scattle ality has laid before the War Deat a recommendation for widening and to a width of 300 feet, with a sum depth of 27 feet at low tide, and and at the hed at the municipal docks, meets an equipment consisting of and cargo sheds, concrete warehouses eral storage, cold storage plants, a detator with a capacity of a million on the edge of tidewater, an icing at brice reservoirs and other arrangethe storage of Oriental olls in bulk. the ways mooring basins and a special set aside for the great fishing fleet a rearly combs the waters of Pugot and Alaska.

and they were about it the Port Comten carried out their enterprise with A terminal unit to see, is not complete with the throwThese were built, and then backed by the special storage houses—the elevator, the oil No port profits by trade to manufacturing or consuming centres else considerable acreage of land convenient



The 125 ton shear leg derrick shown lifting a passenger car is one of the many new and gigantic mechanical devices which help make Seattle notable for its port facilities

the harbor in order to encourage such indus-

Thus far seven plers have been constructed in this nevel community effort. All are larger than the average occun terminal in other ports of the world. And two of them, Smith Cove Pier A and Smith Cove Pier B. outdo anything yet attempted in cargo handling. These two plans are get roughly half a fulle long. One of them is 310 feet wide, but the other has a widto of 365 feet. Early is lined with about four miles of rallroad track, with space for 400 freight cars at at one time for twenty cargo vessels of the 8-800 ton type built by the Shipping Board. Switch connections with the yards of the transcontinental trunk vall lines and han-oling machinery of the most modern design. without congestion and with a minimum warte in time and nower.

Mechanical Equipment Does Away

With Teaming and Hand Labor In themselves these two piers are miniature freight yards. The inner tracks may used for storage of goods in cars. the two outer tracks through or rush freight. be holsted from the holds of the vessels and landed directly in the waiting cars. No reaming or trucking is needed, and little hand labor. Freight is discharged by me-chanical means almost entirely. Examples of this mechanical equipment are a 325borse power gantry travelling crane, a 125ton steel derrick, several 35-ton locomotive cranes, a 12-ton stiff-leg derrick. For crate and lighter package freight a system of tractors and trallers is employed, with inclined conveyors for loose grains and seeds and the like, electric stacking elevators for boxed goods, gravitor roller conveyors and other devices.

That genuine economics result from these methods the records amply prove in items such as these: 5.768 barrels of oil unloaded from the steamer City of Spokane at a cost of nine cents a barrel; 2,000 tons of beancake and sugar from the same vessel handied by tractors, trailers and unloading platforms, at 20 cents a ton; 1,000 tons of beans, rape seed and maize from a Japanese ship at 39 cents a ton. A recent feat was the unloading of six 55-ton boilers from car to ship's hold at an average rate of a boller ed every 13 minutes.

Goods have been moved by tractor trains directly from shipside to the warehouse for term storage without touching the dock transit shed floor. And as ships are kept waiting at dock for shorter periods of uncading, they become more profitable to their

About one-third of the water borne commerce of Scattle is cared for by these public they were have handled 60 per cent, of the transpacific freights passing through the port, in-

ward and outward. In 1918, during wartime strains, 40 per cent, of the transthe result that in that year at least it become the second port of the country.

High Pier Rentals Eliminated

rentals as high as \$300,000 a year for dock conveniences far lower than the roomy Seattle standard. Yet these municipal docks of the Western port are operated on genall times. In a word, these publicly owned freight connection and shin approach. In other ports steamship companies are subject to high rental for piers, to charges for preferential assignments, to charges for berthage. From any place in the world a ship may sall into Scattle and berth without charge for berthage at any of the mu-

Altogether it is an interesting experiment, In Seattle itself it has had a stimulating effect on the privately owned harbor developments. And everywhere else the example set will repay study. Nor is its value as an example vitiated by the fact that Seattle was inspired to this effort by a magnificent trade opportunity. An uncommonly fine natural harbor lay ready to hand. Seattle is fortunate, beyond this, in its geo-graphical location. In mileage to ports in the Far East it enjoys advantages over every other Pacific port. It is nearer to Vladivostok by 296 miles, to Yokehama by 273 miles, 302 nearer to Hongkong, 280 to Batavia, 476 nearer to Manila, and 800 miles nearer to Alaska.

Scattle has its eye on China, Manchuria and Siberia. Returned army engineers have brought back to Seattle newspaper interor later we shall tap in that region the richest granary and mineral region on the face the earth. If these predictions come true, the Atlantic coast may expect to sink into insignificance! Cot. George H. Emerson, general manager of the Great Northern Railway, who organized in 1917 a regiment of rallway men and took them to Siberia under terms of the Interallied Commission to operate the Transsiberian Railway, authority for this alarming statement. order to back up his case he referred to the fact that a wheat area greater than that of the United States, Canada and Argentina is tapped by the Siberian railroad. During e war disturbance the 15,000,000 inhabitants of this region raised 400,000,000 bushels of wheat. And for lack of any more suitable lubricant, the Yankee railroad men greased

their locomotive wheels with butter. Harbin is still storing 10,000 carloads of beans, dumped there two years ago, awaiting the market not yet set up for them.

areas, hiding no one knows what mineral mies in operation in the small ports of priceless but outworn properties to take wealth, and yearly producing riches in un- Europe. In the technical and practical way, over no hard and fast customs and prejumarketable beef, butter, hides and so on, from pins to locomotives. Naturally Seat-done and in what spirit. A communal ef-tile, with five transcontinental trunk lines love, a municipality organized in such a ever-Seattle saw at its back, in addition to this prospect be-

fore it, is seeing visions. At that, it is not the technical methods which it has risen to such an opportunity years New York has had before it, to commanner for such a purpose, is something of it

The city of Seattle dug this canal connecting the Pacific Ocean with Lakes Washington and Union, and the Government put in the locus

pictured here. These locks can accommodate vessels up to 780 feet in length. The building of the canal gave Seattle a combined water front

ere cargo bandling appliances and econo- angle generation. It had accumulated no Scattle may have little new to show. Not dices to break down. It had no need to cut the thing done is important, but how it was acide tough old growths in cutting fresh lort, a municipality organized in such a ever-Seattle saw its opportunity, and met periment. Its people had unity of purpose, in a port so great among interests so vast risk a novel step in the loan of municipal enjoyed a last and greater advantage. The feats may be easter in a small and compact

Dr. Coblentz Explains Invention For Measuring Heat From Stars

cently a communatively unknown

of the Eureau of Standards to Washington, same laboratory following the completion of his university and undergraduate work, suddenly has become timous as one of perhaps four men in the world regarded as the greatest authorities on a particular scien-

For inventions and discoveries of methods for determining and accurately measuring the radiant heat reaching the earth from the stars and other heavenly bodies Dr. pacific freight went through Sestile, with Coblentz has been awarded the Janssen. medal by the French Academy of Sciences. This means that Dr. Coblents has become a commanding figure in the scientific world,

By Publicly Owned Terminals The award of this medal is a distinction In New York harpor steamship lines pay coveted by many scientists, though won by few. It is regarded as one of the highest recognitions within the gift of those authorized to confer scientific honors. It was won rous and equal terms to all commerce at by Dr. Coblents not in any contest with others, nor in any test with set rules, qualiterminals are a free highway, open allike to fications and so on, but is a wholly unsought thing, growing out of the fact that the work done by him has, in the opinion of those who make the award, placed him within the high circle of men whose names

Dr. Coblentz was entirely unaware that was being considered for such recognition until he with other readers of newspapers saw in a cabled despatch from Paris

that the award had been made. "Naturally I am highly gratified," said Dr. Coblentz, who gets his title from the fact that he took a doctor's degree in science in Cornell University in 1963. "But I don't know what more there is to say about I never was any hand to talk about myself, and this makes me less inclined to do so than ever."

Messages of congratulation have poured into the physics laboratory from every quarter of the globe, and there has been a constant stream of callers in person or messages by telephone or telegraph for days. These evidences of fame have had the effect of embarrassing the person to whom they are directed almost beyond the power of speech, a fact that was very apparent to

Invention Is for the Purpose of Measuring Heat Received from Stars

To relieve the a untion somewhat it was suggested that he describe his invention "It relates to the sensitivity of stellarbolometers and at llar thermocouples, the measurements of total radiation, not only standing it is perhaps unnecessary as to the emissivity of blue as compared plain," said Dr. Coblentz. "For instance, with red stars, but other phases of astroradiometric research, the differentiation of tube containing a vacuum, or a space freed sclenium and photoelectric cells," he began as wholly as possible from air, because the

No layman could grasp that mouthful, measurements of heat from the stars. but the change in the conversation, away from his personal he ors and to the subject at once put him

paper English," he said with a smile. Without attempting to reproduce his ex- power of the attachment used."

spite of his evident desire to avoid them. Mount Hamilton, California, fitted with a for the sake of giving a popular understand. Crossley reflector. The reflector is situated ing of the subject, here is what the inven- at an altitude of about 4,000 feet.

stars by an operation as simple to him as science to estimate its importance, in ensuring a board with an ordinary rule is to a carpenter. — all of the help to be stree for there are various obstructions that tween the star under observation and the likewise complete simplicity. But it is sim-

The instrument by which this is done to a portance "thermocouple." To the layman it looks like a pipe made of glass. The bowl of the pipe is flat, however, with a circle in centre that is transparent. Looking through one sees four tiny dots about the size of a pinhead, arranged in the form of a square

Tiny, almost invisible wires, one made of platinum and the other of bismuth, meet each of these dots forming a geometrical figure suggesting a spider's web. and the spider's web are probably the most important features of the discovery made by Coblents and are the work of his own hands done in his laboratory.

Process of Measuring Stars With Flash of Light From Star

Connected with these wires are other wires which in turn are connected with scale, spaced at intervals, as a carpenter's rule is spaced, and marked with numerals which record the measurement to be made

Before it will function this entire instrument is placed in the barrel of an astronomical telescope, between the small lens next to the eye of the observer and the arge convex lens nearest the star or other heavenly body to be observed.

The process of measuring the heat begins when the light from the star flashes from the heavens through the telescope, passing through the "bowl of the pipe," or, more scientific, passes through the wires of the "thermocouple" and the four black dots In accordance with scientific laws the passage of this light from the star into the telescope and through the wires of the "thermo-

The current set in motion energizes the larger wires connected with the scale and causes a point of light to pass along the scale to a certain point, where it comes to The numerals and spaces revealed by the light are the "indicators" of the amount of heat from the star, or at least the accurate basis for determining that heat through mathematical computations simple as A B C

to scientists like Dr. Coblentz, "There are many other features connected with the instrument that for popular underwhat you call the 'end of the pipe' is a glass presence of air interferes with accurate

"The materials used are of the smallest sensivity attained was found to depend more "All right, I will try and put it into news- upon low heat capacity and low heat conductivity than upon a high thermo-electric

on is:

"What is the value of your invention to First of all, it chables a scientist to meas, science?" Dr. Coblentz was asked. He reare the amount of heat received from the piled that the discovery is too new for

enter into the matter, such as atmospheric become of great importance in the commernterference, cross currents of electricity, cial world in industries where the measurethe difficulty of securing a perfect acoum ment of high temperatures is a factor. He sich to work and the matter of several suggested, for instance, that in glass earth, which prevent complete accuracy and be carefully observed and measured to promocouple' may become of tremendous un-

> In some of the intermediate developments which led to the final discovery of the thermocouple by Dr. Coblentz there was a number of devices which proved of vast practical use in the war.

Dr. Coblentz developed the "thermopile. This device, in appearance not unlike the thermocouple, also reacts to the waves of tory, to "radiant" heat as distinct from "re-

For instance, if the thermopile were in the hands of a man in the trenches on one side of "No Man's Land" in the vicinity of the enemy's lines it would record the presence of a hidden for even on the darkest right. The heat from the for's body would register on the thermopile, which also would act as a compass by the same electric reaction, and thus the foe could be detected. The thermoptle, it may be said, is a small affair that one could slip into the vest pocket, and the heat from outside generates an electric current, the remainder of the "detection" of the presence of an enemy being completed simple apparatus.

It was of equal value in detecting the presence of submarines or of battleships, likewise of airplanes at night, locating them with far greater accuracy than could be done by the sound waves.

By another principle which is applied in the use of the thermocouple one is enabled to signal in the dark over long distances, using the Morse code in much the same marner as it is used in sunlight by the

heliograph. Going back for a moment to the rank Dr. Coblentz takes among scientists, Dr. Strat-ton says of him that there are but three, or possibly four, other men in the world who know as much about his subject, astrophysics. Most of his research work has been performed during the years he has been working in the Bureau of Standards

beginning in 1995. The Modest Discoverer

Is a Bachelor From Ohio

Dr. Coblentz is 47 years old, a bachelor, was born in Ohio in 1873 and began life on a farm. He always manifested a deep interest in mechanics, electricity and similar subjects in their simpler forms. It was not until 1896, however, that he undertook to obtain a college education and, as he says of himself, "I began rather late and so was slow in arriving."

and devotion to the work in his laboratory have several times prevented him from accepting flattering commercial offers commanding much better remuneration than is The experiments in measuring star heat afforded by the meagre Government salary.























